If we are going to teach graduate students how to teach . . .

It is increasingly being recognized that the teaching of physiology (actually all of the biomedical disciplines) in graduate and professional programs is being done by individuals with no formal training as teachers (6). While this is certainly not the only, or perhaps even not the major, cause of the current crisis in medical education, improvements in teaching physiology must ultimately come from physiology faculty who are better teachers.

Van Liew (12) has described an interesting and valuable first step in the process of improving physiology teaching, a required course for graduate students in the Physiology Department at State University of New York at Buffalo, entitled Introduction to Teaching of Biological Sciences. The components of this course offer students a wide array of experiences that should help prepare fledging instructors for their teaching tasks. Every physiology graduate program organizer ought to think seriously about requiring the students to take a course of this kind.

However, if we are going to teach graduate students how to teach, we ought to be more ambitious than the Buffalo program seems to be; much is now known about the teaching/learning process and its evaluation, and this understanding should be incorporated into any program aimed at preparing teachers of physiology.

While the learning process can not yet be characterized and described with the kind of rigor that we now apply to the study of physiological phenomena (7), it is clear that cognitive science and educational psychology have made tremendous strides in understanding what occurs as a student attempts to learn a scientific discipline such as physiology (10). Approaches to facilitating the basic learning process itself have been described (8), some of the factors involved in the learning of scientific concepts have been explored (4, 8, 9), and the issues involved in teaching thinking and problem solving have been studied (4, 11). Mastery of physiology is not easy for students, and as teachers we need to understand why it is difficult and, perhaps more to the point, how to make it less difficult.

However, here, too, progress is rapidly occurring; the cognitive processes that are involved in teaching are similarly being investigated and increasingly understood (5) and the relationships between teacher behavior and student achievement are becoming better understood (1). Although much of the work in this area has focused on teaching in primary school, the principles that are being uncovered are clearly applicable to teaching at the graduate or professional level. For example, Mahler and Neuman (6) have described a teacher-training program for medical faculty (from clinical and behavioral and basic science areas) that focuses on the “cognitive level of teacher-student knowledge transmission,” whereas Edwards et al. (3) have described a program for improving the teaching skills of medical residents.

This growing knowledge about the teaching/learning process is making it possible for us to carry out realistic and useful evaluations of teaching. While this remains a controversial subject for most faculty (and graduate and professional faculties are no exception), it is certainly possible to devise evaluation programs that are educationally sound, and hopefully effective, while being fair to the faculty (2). Similarly, it should be possible to evaluate the progress made by our student physiology teachers and to assess the effectiveness of our physiology teacher training programs.

I do not expect that the physiology faculty involved in planning and implementing a course on the teaching of physiology will be experts in the area of pedagogy. Nevertheless, it is not unreasonable to expect them to have considered some of the applicable knowledge of pedagogy in planning their courses on teaching, whether this is achieved through appropriate consultation with their university colleagues who are experts in the field or through their own self-study.

So, while I applaud Van Liew and his colleagues for their willingness to grapple with the important issue of teaching graduate students to teach, I do hope that they and others will attempt to add the kind of rigor to this effort that they certainly expect in their research and that is increasingly possible in pedagogy.

REFERENCES
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